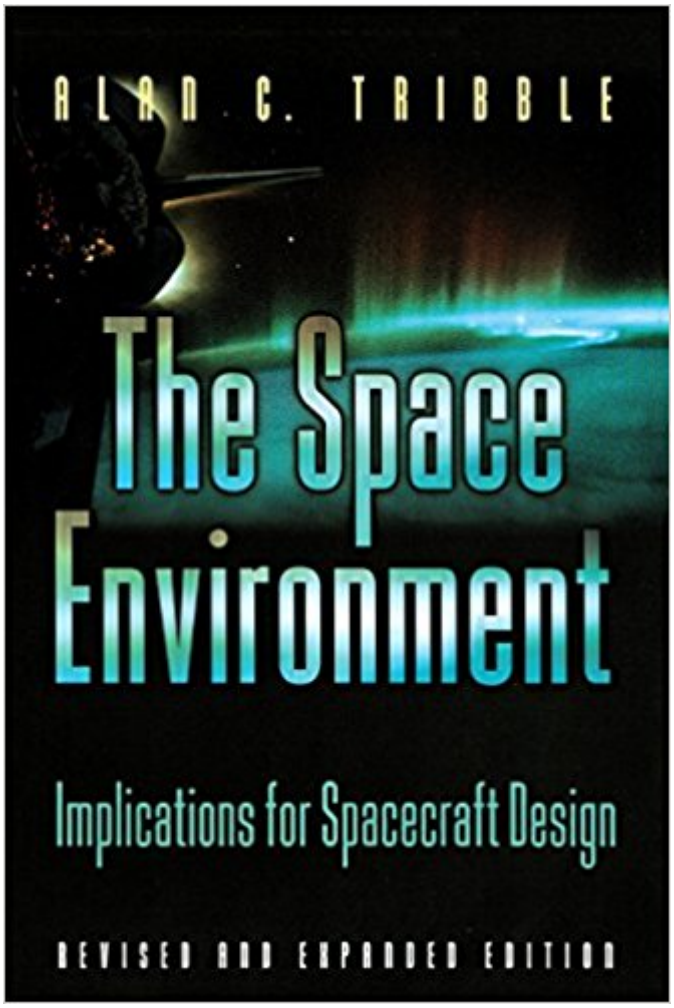
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The Space Environment: Implications For Spacecraft Design



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Synopsis

The breakup of the Space Shuttle Columbia as it reentered Earth’s atmosphere on February 1, 2003, reminded the public--and NASA--of the grave risks posed to spacecraft by everything from insulating foam to space debris. Here, Alan Tribble presents a singular, up-to-date account of a wide range of less conspicuous but no less consequential environmental effects that can damage or cause poor performance of orbiting spacecraft. Conveying a wealth of insight into the nature of the space environment and how spacecraft interact with it, he covers design modifications aimed at eliminating or reducing such environmental effects as solar absorptance increases caused by self-contamination, materials erosion by atomic oxygen, electrical discharges due to spacecraft charging, degradation of electrical circuits by radiation, and bombardment by micrometeorites. This book is unique in that it bridges the gap between studies of the space environment as performed by space physicists and spacecraft design engineering as practiced by aerospace engineers.

Book Information

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Customer Reviews

"Anyone involved in the design, production, or use of instruments in space would benefit from access to a copy of this book. It collects together . . . subject areas that are more typically dealt with by single-topic specialists, and covers these aspects of the space environment in a readable, no-nonsense style."--Observatory"Successfully bridges the divide between the space physicists’ and the spacecraft design engineers’ views of the space environment. It is a much needed and timely book."--M. J. Rycroft, Journal of Atmosphere and Terrestrial Physics"This splendid book . .

.[is] both an up-to-date reference and a textbook. . . . Very readable for both technical and lay audiences."--Choice

Through offering insight into the nature of the space environment and how spacecraft interact with it, Alan Tribble presents a unifying, up-to-date account of the environmental effects that can damage or cause poor performance of orbiting spacecraft.

This book is one of the best I have found on the topic of a spacecraft's environment. It provides an introduction the many environments one finds with launch, various orbits and deep space missions. The physic of space are presented with enough detail that the engineer involved in spacecraft design gains an understanding of the environments that are encountered in space. The excellent references at the end of each chapter allow the reader to study the topic in more depth when needed. The book is written in a textbook format, with compulsory study questions at the end of each chapter. At times the math seemed disproportionate or irrelevant to the topic, but that is not unlike most textbooks. The several charts and figures are clear and applicable to the discussion in the text, never superfluous. I expected this book to serve as a reference that I could pull from the shelve, when needed, but the book is so well written and enjoyable, I instead read the book cover to cover.

I little bit out of date.

Tribble supplies a good overview of environmental effects on spacecraft. That includes the consequences of being in a vacuum, interactions with neutral particles, plasma interactions (including spacecraft charging), radiation (total dose and single event effects) and hypervelocity impacts. That basically covers the whole field (unless you want to include weightlessness).This book packs a large amount of information, including micrometeoroid fluxes, all sorts of radiation fluxes, nominal and storm plasma conditions, oxygen reaction efficiency, orbital decay times, and solar cycle activity. It's very handy if you work with spacecraft systems or payloads.

I wouldn't call this text amazing, but it is certainly adequate. I used this book for a graduate level course in space environment interactions mostly because there was a lack of other resources available. This book gives a decent overview, without getting too bogged down with the physics involved. However, the professor had to pull a large chunk of his material from other sources (out of

print sources) because Tribble is a little to basic. As an aerospace engineer, I don't care so much about the EE stuff, so Tribble does a good job summarizing the EE physics. Overall, a sufficient reference that gives a good overview of s/c-environment interactions.

I bought this book along with about 7 others like it and this was only one of two that were great at explaining everything in words a high school student would understand! This book is amazing and after taking AP Chemistry and Physics it has become even more useful! If you want to design the fuselages of spacecraft this is a must buy! Also Alan Tribble has written a few other good books I have seen.

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